

REMARKS

In the Office Action, the Examiner rejected claims 1, 2, 11, 17 and 18 as anticipated by the Hell et al. reference, rejected claim 4 as obvious over Hell et al., rejected claims 1, 2, 12 – 14, 17, 18 and 20 as obvious over Hounfield in view of Woolenweber, rejected claims 3, 16, 19 and 21 as obvious over Hounsfield and Woolenweber in view of Crago, and indicated that claims 5 – 10 and 15 would be allowable if rewritten in independent form.

Allowable Claims

Applicant thanks the Examiner for the indication of allowable subject matter in claims 5 – 10 and 15. These claims have either been redrafted in independent form or to depend from allowable independent claims. As such, the claims 5 – 10 and 15 are in form for allowance.

35 USC §102(b)

The Applicant respectfully submits that the invention as defined in the claims 1, 2, 11, 17 and 18 is not anticipated by the cited prior art to Hell et al. .

The examiner argues that the Hell et al. reference US Patent No. 6,412,979 B1 provides a cooling method and a corresponding system for components of a computer tomography system with the following features:

- a) an air feed device including:
- b) an air compressor operable to compress air, and
- c) streaming elements connected to receive the compressed air from that air compressor and disposed and formed such that the compressed air flows onto the components to be cooled.

Applicant respectfully disagrees. The examiner is requested to consider that an entirely different system is described in the patent to Hell et al.; in the system of Hell et al. the components of the CT apparatus are not cooled with compressed air.

In this regard the Applicant initially notes that the system as disclosed in the Hell et al. reference is also a starting point of the prior art described in the present application. The German patent document DE 198 45 756 A1, as cited in the present application, is thus the document establishing the priority of the Hell et al. US 6,412,979 B1 patent and thus concerns the same system.

Applicant respectfully submits that the examiner has not correctly identified the feature a). Namely, the feature a) is not named “an air feed device including” but rather (in the previous wording) “a cooled air feed device” (in the German original version, “Kühlluftzuführeinrichtung”; the term should possibly be changed to “cooling air feed device”).

A further significant point is that, according to feature c), the compressed air is conducted onto the components to be cooled.

On the one hand, this concerns a heat exchanger via which (in the document by Hell) compressed air is blown, not the components of the computer tomography system that are to be cooled in the sense of the present invention (such as, for example, the x-ray source or the components adjacent to this). This is here a heat exchanger itself acting as a cooling device that initially absorbs the heat in the operation of the computer tomography apparatus and, in downtimes of the apparatus, must finally be cooled down in order to be able to subsequently function as a cooling device. As is mentioned in the preamble of the present application, however, this indirect “detour” cooling of the CT components via cooled heat exchangers that must be cooled down again in the downtimes is to be avoided. Inasmuch it is not correct to equate the heat exchangers with the components of the computer tomography system that are to be cooled.

On the other hand, in the patent document by Hell et al. the compressed air is absolutely not used for cooling. The heat exchanger is cooled down in the downtimes by means of coolant water which comes from the reservoir 26 and is supplied to the heat exchanger via a pump 27, a multi-channel valve 20 as well as a quick release coupling 21. As soon as the heat exchanger has been sufficiently cooled, before decoupling of the quick release coupling care is taken to ensure that the feed lines in the region of the coupling are free of coolant water. The compressed air 28 is used only for this purpose (see column 4, line 61 through column 5, line 14 of the by Hell et al. patent).

It is also wholly incorrect to say that here the compressed air is directed onto the components of the computer tomography apparatus that are to be cooled or that the compressed air device is a “cooling air feed device” at all since the heat exchanger is no longer to be cooled at all at the moment at which compressed air is forced into the line.

Applicant submits that the subject matter of the patent claim 1 is novel relative to the patent by Hell et al. and respectfully asserts that the rejection of claim 1 under § 102 is in error.

The same comments apply for the claims 2 and 11 as are presented above relative to claim 1. Likewise, the same arguments also justify finding novelty in claims 17 and 18.

35 USC §103

The rejection of claim 4 as obvious over Hell et al. is also in error. Since no cooling air is provided through the line at all but rather only compressed air is forced through the line to cause emptying of the coolant water circuit, the person of ordinary skill would not have recognized why these lines should be used in a heat-insulated manner on the bases of the cited prior art.

Applicant respectfully disagrees with the obviousness rejection of claims 1, 2, 12-14, 17, 18 and 20 over Hounsfield and Woolenweber. The examiner initially states that a cooling method and a cooling system for the components of a computer tomography system within a gantry housing are already described in the document by Hounsfield (US 4,115,697) and that this system also comprises an air feed element as well as streaming elements which are arranged such that air is blown onto the components to be cooled. The examiner acknowledges that no compressed air compressor is shown in the patent by Hounsfield, meaning that no cooling with compressed air occurs.

Instead of combining this with US 3,151,471 as in the first action, the examiner in this action introduces a new reference in which a cooling with compressed air is used, in particular the patent to Woolenweber US 6,129,524 A. Woolenweber deals with a motor for a compressor that must likewise be cooled. For cooling, a portion of the compressed air generated by the compressor is used for cooling of the motor and the electronic components coupled thereto.

In Hounsfield, the components of the computer tomography system that are to be cooled (such as, for example, the x-ray source generating the heat) are simply not cooled directly. Instead, the reference again provides a cooling device (namely a heat exchanger in a cooling circuit) that accumulates the heat that is generated in the operation of the actual components of the computer tomography system to be cooled and cools these components during the downtimes of the system. This teaching is contrary to the present invention

because the present invention provides for direct cooling of the components of the computer tomography system to be cooled by means of the compressed air.

The person of ordinary skill in the art would not consider the improvements of the invention obvious. It is only with the hindsight gleaned from a review of the present invention that the features of the prior art would be selected and combined and used and asserted by the Examiner. For example, the examiner has gathered individual features from the prior art documents, regardless of how far apart they lie, in order to then explain why the invention is obvious. It is at first not recognizable once why the person of ordinary skill in the art in the medical-technical field should draw upon the document by Woolenweber at all. Woolenweber has nothing in the least to do with medical-technical systems or related things. Instead the reference concerns a compressed air compressor in which the generated compressed air is used in order to cool the compressor itself.

Even if the average man skilled in the art would know this document, it is not apparent to us why the ordinary person should transfer the principle of compressed air cooling to a medical-technical apparatus since the compressor would have to be provided as an extra component in order to generate the compressed air. In contrast to this, in the patent by Woolenweber the compressed air is already provided by the compressor itself and would not require an added component.

From the collected teachings of all of the cited references, no inducement at all is found which would cause the average man skilled in the art to resort to a compressed air cooling for cooling of the components in a CT system or, respectively, to search for the document by Woolenweber or similar documents in which any components have been cooled with compressed air. Although the patent by Hell et al. does teach a compressor for generation of compressed air within a cooling system for a CT system, the compressed air is not directly used for cooling of the components. If the use of compressed air for direct cooling of the components of the CT system was obviated in such a manner, the question is posed of why in US Patent No. 6,412,979 such a cost is carried and the compressed air present there is not used for cooling; rather, instead of this the basic principle explained in the document by Hounsfield of cooling by means of a heat exchanger that is cooled in the downtimes of the gantry is further developed in a wholly different direction in that the cooling via the use of coolant water is designed more effectively.

Applicant submits that the collected teachings of the cited prior art show very clearly that the invention appears to be simple only in retrospect with knowledge of the present invention, and that the invention was not actually so obvious.

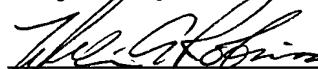
Claim Amendments

The claims 1, 17 and 18 have been amended to provide that the compressed air flows directly onto the components to be cooled. The term "directly" is disclosed on page 3 in the third paragraph in the original specification.

Conclusion

Each issue of the office action has been addressed. All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Respectfully submitted,

 (#31,870)

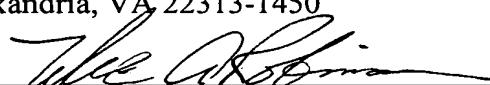
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